

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A An implantable microchip device for the controlled release of drug molecules comprising:
- a substrate comprised of two or more substrate portions bonded together;
- at least two reservoirs in the substrate, each containing a release system comprising drug molecules for release; and
- a reservoir cap positioned on, or within a portion of, each of said at least two reservoirs and over the molecules for release, the molecules for release being releasable from the device by diffusion through or upon disintegration of the reservoir caps, wherein the release of the molecules from each reservoir is controlled by said diffusion through or disintegration of the reservoir cap positioned thereover,
- wherein the device is packaged for implantation into a patient.
2. (Original) The device of claim 1 wherein the substrate comprises an upper substrate portion adjacent the reservoir cap and a lower substrate portion distal the reservoir cap.

3. (Currently Amended) ~~The device of claim 2~~ A microchip device for the release of molecules comprising:

a substrate comprised of two or more substrate portions bonded together;
at least two reservoirs in the substrate, each containing molecules for release; and
a reservoir cap positioned on, or within a portion of, each of said at least two
reservoirs and over the molecules for release, the molecules for release being releasable from the
device by diffusion through or upon disintegration of the reservoir caps, wherein the release of
the molecules from each reservoir is controlled by said diffusion through or disintegration of the
reservoir cap positioned thereover,

wherein the substrate comprises an upper substrate portion adjacent the reservoir
cap and a lower substrate portion distal the reservoir cap, and wherein a reservoir section in the
upper substrate portion is in communication with a reservoir section in the lower substrate
portion, the two reservoir sections forming a single reservoir.

4. (Original) The device of claim 3, wherein the reservoir section in the lower substrate portion has a volume that greater than the reservoir section in the upper substrate portion.

5. (Currently Amended) ~~The device of claim 2~~ A microchip device for the release of molecules comprising:

a substrate comprised of two or more substrate portions bonded together;

at least two reservoirs in the substrate, each containing molecules for release; and


a reservoir cap positioned on, or within a portion of, each of said at least two reservoirs and over the molecules for release, the molecules for release being releasable from the device by diffusion through or upon disintegration of the reservoir caps, wherein the release of the molecules from each reservoir is controlled by said diffusion through or disintegration of the reservoir cap positioned thereover,

wherein the lower substrate portion is provided with an internal reservoir cap interposed between a reservoir section of the upper substrate portion and a reservoir section of the lower substrate portion, wherein release of the molecules from the reservoir section in the lower substrate portion is controlled by diffusion through or disintegration of the internal reservoir cap.

6. (Original) The device of claim 5, wherein the internal reservoir cap is disintegratable, so that the two reservoir sections form a single reservoir.

7. (Original) The device of claim 5, wherein the reservoir section of the lower substrate portion contains molecules different in quantity, type, or both quantity and type, from the molecules contained in the reservoir section of the upper substrate portion.

8. (Currently Amended) The device of claim 1, wherein one of said at least two reservoirs comprises different types of drug molecules, different amounts of drug molecules, or combinations thereof, compared to another of said at least two reservoirs.

 9. (Canceled).

10. (Currently Amended) The device of ~~claim 9~~ claim 1, wherein at least one reservoir cap is disintegratable and the release system in a reservoir is disintegratable to release the molecules after the disintegration of the reservoir cap.

11. (Currently Amended) ~~The device of claim 1 further comprising a cathode, a microprocessor, a timer, a demultiplexer, and a power source~~ A microchip device for the release of molecules comprising:

a substrate comprised of two or more substrate portions bonded together;

at least two reservoirs in the substrate, each containing molecules for release;

a reservoir cap positioned on, or within a portion of, each of said at least two reservoirs and over the molecules for release, the molecules for release being releasable from the device by diffusion through or upon disintegration of the reservoir caps, wherein the release of the molecules from each reservoir is controlled by said diffusion through or disintegration of the reservoir cap positioned thereover; and

a cathode,

wherein at least one reservoir cap is an anode, such that upon application of an electric potential between the cathode and anode, said at least one reservoir cap disintegrates to release the molecules from the reservoir which is under said at least one reservoir cap.

12. (Currently Amended) The device of ~~claim 9~~ claim 1, wherein the release system comprises drug molecules in an excipient or diluent.

13. (Currently Amended) The device of ~~claim 9~~ claim 1, wherein the release system further comprises a biodegradable matrix.

14. (Currently Amended) ~~The device of claim 1~~ A microchip device for the release of molecules comprising:

a substrate comprised of two or more substrate portions bonded together;

at least two reservoirs in the substrate, each containing molecules for release; and

a reservoir cap positioned on, or within a portion of, each of said at least two

reservoirs and over the molecules for release, the molecules for release being releasable from the device by diffusion through or upon disintegration of the reservoir caps,

wherein the release of the molecules from each reservoir is controlled by said diffusion through or disintegration of the reservoir cap positioned thereover, wherein at least one reservoir cap is non-disintegratable, and wherein the rate of diffusion of the molecules through the cap determines the time at which the molecules are released from the reservoirs.

15. (Original) The device of claim 1 wherein the substrate comprise three or more substrate portions bonded together.

16. (Currently Amended) A method for the delivery of drug molecules into a patient comprising:

providing at a site in the patient where molecules are to be delivered a microchip device which comprises a substrate comprised of two or more substrate portions bonded together, at least two reservoirs in the substrate, each containing a release system comprising drug molecules for release, and a reservoir cap positioned on, or within a portion of, each of said at least two reservoirs and over the molecules for release; and

controllably releasing said molecules from each of the reservoirs by said diffusion through or disintegration of each of the reservoir caps.

17. (Canceled).

18. (Currently Amended) The method of ~~claim 17~~ claim 16, wherein the drug is selected from the group consisting of nucleic acids, proteins, amino acids, polysaccharides, organic molecules, and synthetic molecules.

19. (Currently Amended) The method of ~~claim 17~~ claim 16, wherein the drug is in combination with a pharmaceutically acceptable carrier.


20. (Canceled).

21. (Original) The method of claim 16 wherein the molecules are released in a pulsatile or continuous manner.

22. (Canceled).

23. (Currently Amended) The method of ~~claim 22~~ claim 16, wherein the release system is formed by the molecules to be released.

24. (Original) The method of claim 23, wherein at least one reservoir cap is disintegratable and the reservoir caps are positioned on the reservoirs over the release system, wherein the rate of disintegration of the reservoir cap or the rate of diffusion of the molecule through the reservoir cap determines the time at which the molecules are released from the reservoir.

 25. (Canceled).

26. (Original) The method of claim 16 wherein at least one reservoir cap is non-disintegratable and wherein the rate of diffusion of the molecules through the cap determines the time at which the molecules are released from the reservoirs.

27-42. (Canceled).

43. (Currently Amended) The device of ~~claim 42~~ claim 1, wherein the drug molecules are in combination with a pharmaceutically acceptable carrier.

44. (Currently Amended) The device of ~~claim 42~~ claim 1, wherein the drug molecules comprise a nucleic acid, a protein, an amino acid, or a polysaccharide.

45. (Currently Amended) The device of ~~claim 42~~ claim 1, wherein the drug molecules comprise a hormone.

46. (Currently Amended) The device of ~~claim 42~~ claim 1, wherein the drug molecules comprise a synthetic, organic molecule.

47. (Currently Amended) The device of ~~claim 42~~ claim 1, wherein the drug molecules are selected from the group consisting of anesthetics, vaccines, chemotherapeutic agents, metabolites, immunomodulators, antioxidants, antibiotics, and ionic channel regulators.

48. (Canceled).

49. (Currently Amended) ~~The device of claim 48~~ A microchip device for the release of molecules comprising:

a substrate comprised of two or more substrate portions bonded together;

at least two reservoirs in the substrate, each containing molecules for release; and

a reservoir cap positioned on, or within a portion of, each of said at least two reservoirs and over the molecules for release, the molecules for release being releasable from the device by diffusion through or upon disintegration of the reservoir caps,

wherein the release of the molecules from each reservoir is controlled by said diffusion through or disintegration of the reservoir cap positioned thereover and wherein the molecules comprise a chemical reagent for use in a polymerase chain reaction or another nucleic acid amplification procedure.

50. (Currently Amended) The device of claim 1, wherein the drug molecules for release are in a liquid form.

51. (Currently Amended) The device of claim 1, wherein the drug molecules for release are in a solid form.

52. (Currently Amended) ~~The device of claim 1 which~~ A microchip device for the release of molecules comprising:

a substrate comprised of two or more substrate portions bonded together;

at least two reservoirs in the substrate, each containing molecules for release; and

a reservoir cap positioned on, or within a portion of, each of said at least two

reservoirs and over the molecules for release, the molecules for release being releasable from the device by diffusion through or upon disintegration of the reservoir caps,

wherein the release of the molecules from each reservoir is controlled by said

diffusion through or disintegration of the reservoir cap positioned thereover and wherein the device releases the molecules in a pulsatile manner.

53. (Previously Presented) The device of claim 1, which releases the molecules in a continuous manner.

54. (Previously Presented) The device of claim 1, wherein the reservoir cap comprises one or more polymers.

55. (Previously Presented) The device of claim 1, wherein the reservoir cap comprises a metal thin film.

56. (New) A method for the delivery of molecules comprising:

providing at a site where molecules are to be delivered a microchip device which comprises (i) a substrate comprised of two or more substrate portions bonded together, (ii) at least two reservoirs in the substrate, each containing molecules for release, (iii) a reservoir cap positioned on, or within a portion of, each of said at least two reservoirs and over the molecules for release, wherein each reservoir cap is an anode, and (iv) a cathode; and

applying an electric potential between the cathode and anode, to disintegrate the reservoir cap and release the molecules from the reservoir thereunder.
